

Please add new claims 26-42 as follows:

NEW CLAIMS

26. A process for removing sulfur from a hydrocarbon comprising:
conveying a feed stream past a first side of a solid membrane, wherein said feed stream comprises a feed liquid hydrocarbon and a feed sulfur species;
conveying a sweep stream past a second side of said solid membrane, wherein said sweep stream comprises a decoupling agent species;
transporting said feed sulfur species from said feed stream through said solid membrane in a permeate into said sweep stream, thereby converting said sweep stream to a sulfur-enriched stream and said feed stream to a substantially sulfur-free reject stream containing a primary hydrocarbon product.

27. The process of claim 26 wherein said membrane contains a facilitated transport liquid.

A7 28. The process of claim 27 wherein said facilitated transport liquid is selected from the group consisting of amines, hydroxyamines, alcohols, and mixtures thereof.

29. The process of claim 26 wherein said decoupling agent species is selected from the group consisting of amines, hydroxyamines, alcohols, sulfur compounds, and mixtures thereof.

30. The process of claim 27 wherein said decoupling agent species is selected from the group consisting of amines, hydroxyamines, alcohols, sulfur compounds, and mixtures thereof.

31. A process for removing sulfur from a hydrocarbon comprising:
conveying a feed stream past a first side of a solid membrane, wherein said feed stream comprises a feed liquid hydrocarbon and a feed sulfur species and wherein said solid membrane contains a facilitated transport liquid;

transporting said feed sulfur species from said first side into said solid membrane

in a permeate;

complexing said feed sulfur species with said facilitated transport liquid to form a facilitated transport complex;

transporting said facilitated transport complex through said solid membrane to a second side of said membrane, thereby converting said feed stream to a substantially sulfur-free reject stream; and

decoupling said at least one sulfur species and said facilitated transport liquid by contacting said facilitated transport complex with a decoupling agent species on said second side.

32. The process of claim 31 wherein said decoupling agent species is selected from the group consisting of amines, hydroxyamines, alcohols, sulfur compounds, and mixtures thereof.

33. The process of claim 31 wherein said facilitated transport liquid is selected from the group consisting of amines, hydroxyamines, alcohols, and mixtures thereof.

34. The process of claim 1 wherein said one or more compounds from which said selective solid membrane is constructed is an organic polymer.

35. The process of claim 1 wherein said one or more compounds from which said selective solid membrane is constructed is selected from the group consisting of polyacrylonitrile, polyamide, polysulfone, and combinations thereof.

36. A process for removing sulfur from a hydrocarbon comprising:

conveying a feed stream past a first side of a selective solid membrane, wherein said feed stream comprises a feed liquid hydrocarbon and a feed sulfur species, and further wherein said selective solid membrane is constructed from one or more compounds providing greater permeation selectivity for said feed sulfur species than said feed liquid hydrocarbon; and

transporting said feed sulfur species from said feed stream through said selective solid membrane to a second side of said selective solid membrane, thereby converting said

feed stream to a substantially sulfur-free reject stream containing a primary hydrocarbon product.

37. The process of claim 36 wherein said one or more compounds from which said selective solid membrane is constructed is an organic polymer.

38. The process of claim 36 wherein said one or more compounds from which said selective solid membrane is constructed is selected from the group consisting of polyacrylonitrile, polyamide, polysulfone, and combinations thereof.

39. The process of claim 36 wherein said feed liquid hydrocarbon is selected from the group consisting of naphtha, diesel, and mixtures thereof.

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40. The process of claim 36 wherein said feed sulfur species is selected from the group consisting of an organic sulfur compound, elemental sulfur, hydrogen sulfide and combinations thereof.

41. The process of claim 40 wherein said organic sulfur compound is selected from the group consisting of thiols, alkylated thiols, thiophenes, alkylated thiophenes, benzothiophene, alkylated benzothiophenes, dibenzothiophenes, alkylated dibenzothiophenes and mixtures thereof.

42. The process of claim 36 wherein said one or more compounds from which said selective solid membrane is constructed is selected from the group consisting of nitrogen compounds, nitrogen oxide compounds, oxygen compounds, sulfur compounds, sulfur oxide compounds, and mixtures thereof.
